

BASIC PHOTO INTERPRETATION SCALE PROBLEMS

These problems do not involve stereo vision. A stereo pair is included in each problem for your interest and to aid you in checking the edges of the objects to be measured.

Please write your name and the answers on a 5 X 8 card. Do your figuring on the work sheets. Answers will be discussed after cards are handed in.

PROBLEM A

Find the diameter of the base of the Jefferson Memorial.

Materials: Vertical photos #22 and #23
USGS map of Washington
Scale .001"

- Procedure:**
- (1) Look at the later margin of your map, find the scale, and write this figure at the top of your work paper. Fold the map to show the Jefferson Memorial area.
 - (2) Inspect photo #23 and orient it with the map.
 - (3) Using the .001" scale, measure on the map the distance between two points shown on the photo.
Example: End-to-end of small lagoon at north of Basin. Multiply this by the denominator of the scale. This is the ground distance between these points.
 - (4) Using the .001" scale measure the distance between the same points on the photo. This is the photo distance between these points.
 - (5) Divide the photo distance into the ground distance. The dividend is the denominator of the photo scale. If your arithmetic was correct you can find any ground distance by multiplying its photo distance by this figure.
 - (6) Before measuring the monument, check for photo distortion by taking another measurement at an angle to the first. Example: Distance between bridge W of Memorial and nearest point of land across Basin. Multiply this by the map scale denominator to find ground distance. Measure the same distance on the photo and divide it into the ground distance. Your second photo scale should be only slightly different. Take the mean between.

(?) Now measure the Monument across the center of the dome to the outside edges of the white steps. Look at it in stereo to check the edges if you wish, but use photo #23 to measure. (Why?) Multiply this measurement by the mean photo scale. This is the diameter in feet of the stylobate (base) of the Monument. Write this figure on the 5 X 8 card.

TRUBLE NOTES:

- (1) If you can't see the small divisions on the scale, try using one lens of the 'scope (it magnifies). To see better, use the little thread counter. It has a scale on the bottom.
- (2) If your figures don't come out right, it is due to one of these causes:
 - a. Mistake in reading scale. Check all measurements.
 - b. Simple error in dividing or multiplying. Check.
 - c. Decimal point trouble. The smallest divisions on the scales are thousandths of a foot. (.001") The largest are tenths (1")
 - d. Did you use the centimeter side of the scale for one or more measurements? (If you use it throughout, you will come out with the right distance in meters.)
 - e. Map error. You may have measured from a point which has changed between the photo and the map, or which was drawn incorrectly on the map. Shorelines vary. Road edges are only approximate.
 - f. Taking too small a map measurement. In general the smaller the distance the greater the error. (This is why the monument cannot be measured directly before finding the scale).
 - g. Failure to measure the same points on map-photo.

PROBLEM B

How long are the sides of the Pentagon?

Materials: Vertical photos #566 and 567
USGS map of Washington
Scale

Procedure: (Same as in Problem A)

- (1) Orient photograph #566 in relation to the map. Write the scale of the map on your working sheet.
- (2) Make two measurements on the map across the center at the

Declassified and Approved For Release 2013/09/11 : CIA-RDP81B00006R000100030011-1
area shown in the photo. Examples: Center to center of various clover-leaves or road intersections. Multiply these measurements by the scale to find the ground distances.

- (3) Measure the same distances on the photo and divide each measurement into the respective ground distance. Take the mean as the photo scale.
- (4) Measure an outer side of the Pentagon and multiply by the photo scale. Write this length for the Pentagon's sides on the 5 X 8 card.

PROBLEM C

Identify the plane taking off from Bolling Field. (Same procedure as A ~ B)

Materials: Photos 515, 516
Air Target Mosaic of Washington
Scale .001"

- (1) Find the scale of the Target Mosaic and write it on your work sheet.
- (2) Measure two distances on the Mosaic and find the ground distance. (i.e. x multiply by the scale.) Examples: Runways
- (3) Measure the same distances on photo #515 and find the photo scale.
- (4) Measure the plane seen taking off and find the actual span and length. (i.e. multiply by photo scale) Note: Why will Photo #515 yield more accurate figures than #516?
- (5) Identify the plane from the list below and write the name on the answer card.

| <u>DISIGNATION</u> | <u>SPAN</u> | <u>LENGTH</u> | <u>NO. MOTORS</u> |
|--------------------|-------------|---------------|-------------------|
| B-17 | 103° 10" | 74° 9" | 4 |
| B-29 | 141° 2" | 99° | 4 |
| B-36 | 230° | 162° 6" | 6 |
| B-47 | 116° | 107° 6" | |
| B-50 | 141° 2" | 99° | Jet |
| C-46 | 108° | 76° 4" | 4 |
| C-47 | 95° | 63° 9" | 2 |
| C-54 | 117° 6" | 93° 5" | 2 |
| C-74 | 173° 4" | 123° 4" | 4 |
| C-124 | 173° 4" | 127° 1" | 4 |
| C-97 | 141° 4" | 110° 4" | 4 |
| C-121 | 123 | 95° 4" | 4 |
| R-60 | 189° 1" | 156° 1" | 4 |